



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-280/84-24 and 50-281/84-24

Licensee: Virginia Electric and Power Company
Richmond, VA 23261

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: August 1-31, 1984

Inspectors: D. J. Burke 10/4/84
D. J. Burke, Senior Resident Inspector Date Signed

D. J. Burke 10/4/84
W. Orders, Senior Resident Inspector Date Signed

D. J. Burke 10/4/84
M. J. Davis, Resident Inspector Date Signed

Approved by: D. J. Burke 10/4/84
for S. Elrod, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This inspection involved 150 inspector-hours on site in the areas of plant operations and operating records, plant maintenance and surveillance, plant security, and followup of events.

Results: In the areas inspected, two violations were identified; failure to follow procedures during replacement of an RPS relay - paragraph 6.d; 10 CFR 50.59 safety evaluation not performed/documented for change to facility as described in FSAR - paragraph 5.e.

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REPORT DETAILS

1. Licensee Employees Contacted

R. F. Saunders, Station Manager
D. L. Benson, Assistant Station Manager
H. L. Miller, Assistant Station Manager
D. A. Christian, Superintendent of Operations
M. R. Kansler, Superintendent of Technical Services
H. W. Kibler, Superintendent of Maintenance
D. Rickeard, Supervisor, Safety Engineering Staff
S. Sarver, Health Physics Supervisor
R. Johnson, Operations Supervisor
R. Driscoll, Director, QA, Nuclear Operations

Other licensee employees contacted included control room operators, shift technical advisors (STAs), shift supervisors, chemistry, health physics, plant maintenance, security, engineering, administrative, records, and contractor personnel and supervisors.

2. Exit Interview

The inspection scope and findings were summarized on a biweekly basis with certain individuals in paragraph 1 above.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items*

Unresolved items were not identified during this inspection.

5. Operations

Unit 1 and 2 operations were inspected and reviewed during the inspection period. The inspectors routinely toured the control room and other plant areas to verify that plant operations, testing and maintenance were being conducted in accordance with the facility Technical Specifications (TS) and procedures. Within the areas inspected, one violation was identified (paragraph 5.e). Specific areas of inspection and review included the following:

- a. Review was made of annunciated alarms in the control room and inspection of safety-related valve, pump, and equipment alignments on the consoles and in the plant.

*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

- b. Unit 1 began the reporting period at 80 percent power. Maximum power is limited to 80 percent due to immovable control rod B-6 (see previous report, 50-280/84-20 and 50-280/84-21). Unit 1 operated at power for the duration of the reporting period; no trips or shutdowns occurred.
- c. Unit 2 began the reporting period operating at full power. On August 9, 1984, a reactor trip occurred from the completion of the 2 out of 3 logic matrix on overpower delta T protection. Prior to the event, the unit was at full power with rod control in manual, and technicians were troubleshooting a failed delta flux indicator (NI-43). Improper use of an ungrounded 120 VAC power cord with a digital voltmeter to obtain detector current measurements caused one of the control power fuses to fail on Nuclear Instrument NI-43. The loss of power to the drawer resulted in completion of the NIS dropped rod protection circuitry, causing a turbine runback to approximately 70%. Immediately following the dropped rod runback, a series of overpower (OP) delta T runbacks ramped the turbine down to 40% of full power. The initiation of the OP delta T trip function was caused by a decreasing OP delta T setpoint due to negative delta flux (as sensed by nuclear instrumentation). Approximately two minutes after the start of the runback, a reactor trip occurred from overpower delta T protection. Immediately after the reactor trip, an overtemperature delta T trip was received. Following the trip, all safety systems functioned normally except for MOV-FW-251C (auxiliary feedwater pump discharge valve) which would not remain closed after the operator manually closed it. The cause of the valve malfunction was a timing control relay which was subsequently replaced. A LER will be submitted on the event and additional testing will be conducted during an upcoming outage. Instructions for proper setup of test equipment are being revised. The unit was subsequently restarted and returned to power operations. The unit operated at power for the remainder of the reporting period.
- d. At 10:50 a.m., on August 9, 1984, two men, an electrician employed by a contractor and a mechanic employed by the licensee, were electrocuted in a non-radiological accident in the turbine building. Two contractor employees were drilling anchor bolt holes into a turbine building wall electrical duct bank near the emergency switchgear room to support Fire Protection System electrical conduits. The electrician was knocked unconscious when the drill he was using struck one of the 4160 volt reserve station service transformer power lines in the concrete duct bank. No reactor or electrical trips occurred. The electrician was taken by helicopter to Norfolk General Hospital and was pronounced dead at 12:25 p.m. The electrician's helper was taken to a Smithfield physician for treatment of an ankle injury.

When the first aid team responded to the accident, one of the team members involved in the rescue attempt contacted the drill which was still embedded in the 4160 volt cable. The mechanic was pronounced dead at the scene by the Surry County medical examiner.

The licensee de-energized the reserve station service transformer and powered affected loads with the emergency diesel generators while an evaluation of the safety, damage, and repairs were made. An

investigation by the licensee and the Virginia Department of Labor and Industry (OSHA) is in progress.

- e. While reviewing the Unit 1 and 2 component cooling water (CCW) system, the inspectors noted that the CCW outlet trip valve from the reactor coolant pump thermal barrier was not numbered on the CCW valve operating numbers print FM-72A. Following investigations, the licensee stated that the three air-operated trip valves (per-unit) on the RCP's were never installed in accordance with an October 11, 1972 proposal by the AE and Design Change 73-106; however, the original high flow trip signal to CCW common trip valve TV-CC-107 (and 207 on Unit 2) was defeated. Relief valves are installed on each RCP thermal barrier CCW line and discharge inside containment, and annunciator alarm procedures direct the reactor operators to close TV-CC-107 (and 207) on high flow indication. The licensee also stated that the check valves on the CCW inlet lines to the RCP thermal barriers, described on FM-72A, were never installed. In addition, the air-operated trip valve on the CCW outlet from the primary drain coolers (HCV-CC-114) was blocked open several years ago due to spurious but frequent trip valve closures. The trip valves are described in Section 9.4 of the Surry updated FSAR as follows: "In the event that a leak occurs in the RCP thermal barrier cooling coil, an alarm annunciates in the control room and the high pressure reactor coolant is safely contained by closing the appropriate stop valve. A high cooling water outlet flow signal from either the thermal barrier cooling header, the excess letdown heat exchanger, or the primary drain cooler automatically closes the isolation [trip] valves." The removal of the automatic trip valve isolation function on high outlet flow from the RCP thermal barriers and primary drain coolers constitute a change in the facility as described in the FSAR and thus requires a written safety evaluation in accordance with 10 CFR 50.59. Contrary to these requirements, a written safety evaluation to determine that the change did not involve an unreviewed safety question was apparently not performed or documented, and is a violation (280 and 281/84-24-01). Subsequent review determined that an unreviewed safety question did not exist concerning this change, and that NRC approval of the change was not required. The reactor coolant is safely contained with the existing components and procedures.

6. Surveillance and Maintenance Activities

During the reporting period, the inspectors reviewed various surveillance and maintenance activities to assure compliance with the appropriate procedures and TS, and verified the operability of major plant systems. One violation was identified in the electrical maintenance area (paragraph 6.d).

Inspection areas included the following:

- a. Inspections of the auxiliary building, subsurface drain systems, cable penetration areas, switchgear and cable rooms, outside areas, steam safeguards and the turbine building were conducted to verify equipment operability and alignment. No violations were identified in the areas inspected.

- b. The inspectors reviewed the control room logs and operations daily and reviewed the reactor coolant system leak rates on a daily basis. Several LCOs in Section 3 of the TS were also verified on a periodic basis to ensure compliance with the requirements. The inspectors also verified that at least two Senior Reactor Operators (SRO) were on duty at all times during reactor operations, and at least one of the SRO's was in the reactor control room at all times.
- c. The inspector requested that the periodic Units 1 and 2 pressurizer power operated relief valves (PORV's) stroke testing be discontinued during power operations in accordance with NRC policy recommendations. The licensee is revising Periodic Test Procedure PT 2.26 to limit PORV stroke timing and testing to outages and operability verification requirements. The MOV block valves will continue to be periodically tested in accordance with TS requirements.
- d. On the evening of August 21, 1984, during replacement of a failed Westinghouse BF relay in the Unit 2 RPS logic during power operation, the following occurred when one of the relay leads was lifted:
 - (1) Motor driven auxiliary feedwater pump 2-FW-P-3B started.
 - (2) The three steam generator blowdown trip valves outside containment went closed.
 - (3) Both source range NI's (N-31 and 32) were reenergized.
 - (4) Five first-out reactor or turbine annunciator alarms were activated on the annunciator panels.

The above conditions were reset and corrected within a few minutes. The licensee did not promptly report the actuation of the Engineered Safety Feature (AFW pump 3B) as required by 10 CFR 50.74(b)(2)(ii), but subsequently determined that although the maintenance and procedures were preplanned, the pump start was not. The event was reported to the NRC using the ENS phone on the morning of August 22, 1984. A written LER will also be submitted. Although procedures, prints, and jumper logs were used to verify the electrical wire or lead removal, the common lead lifting led to the loss of additional BF relays due to a misunderstanding of the series "daisy-chain" wiring installation and inadequate control wiring diagram electrical prints. While reviewing the event, the inspector noted that no reactor trip breakers opened, although the RPS logic indicated that the 'B' reactor trip breaker should have opened. An approved electrical jumper had been installed to bypass the 'B' train reactor trip logic; however, the procedures used did not specify this jumper or bypass, which is a violation of procedures ADM-29.5 and EMP-C-RT-24 (281/84-24-02). The electricians installed the jumper to prevent the 'B' reactor trip breaker from inadvertently cycling during the maintenance. The 'A' train remained operable, and the 'B' reactor trip breaker was closed per EMP-C-RT-24. The licensee's Safety Engineering Staff is performing a failure analysis on Westinghouse BF and BFD relays which have failed recently. (Open Item 280/84-24-03).

7. Plant Physical Protection

The inspectors verified the following by observations:

- a. Gates and doors in protected and vital area barriers were closed and locked when not attended.
- b. Isolation zones described in the physical security plans were not compromised or obstructed.
- c. Personnel were properly identified, searched, authorized, badged and escorted as necessary for plant access control.